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PROCEDURES FOR IMPLEMENTING NEW INFORMATION SIGNAGE IN TRANSPORTATION TERMINALS FOR TRAVELLERS WITH DISABILITIES

Prepared for the
Transportation Development Centre
Policy and Coordination Group
Transport Canada
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December 1990

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Un sommaire en français de ce rapport est inclus avant la table des matières.

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16. Abstract

Recent studies sponsored by the Transportation Development Centre of Transport Canada have identified the lack of appropriate signage as a major issue in meeting the needs of travellers with visual, hearing or cognitive disabilities. Environmental communication systems are designed for the able-bodied adult with above-average vision and hearing.

Changes are required but the procedures involved in change are not well understood. Concerned individuals wishing to improve signage systems face a bewildering array of organizational and procedural hassles. The purpose of this report is to identify and describe the procedures and other considerations involved in the implementation of new information signage and/or communication systems in transportation terminals, such as airports, ferry terminals, bus and railway stations, for persons with visual, hearing or cognitive disabilities.

The report focuses on a number of related questions, such as: What is needed? Who are the major actors? If a change is required, how is it done? What are the hurdles? If change is accomplished, how is success measured? Who regulates and enforces conformance with established and/or proposed standards?

After noting that most standards relating to signage emanate from standards published by the Canadian Standards Association (CSA), it is recommended that any new or proposed changes be submitted to the CSA for consideration as a national standard.

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16. Résumé

Le Centre de développement des transports de Transports Canada a récemment parrainé des études qui ont révélé l'insuffisance de la signalisation en place dans l'optique particulière des voyageurs souffrant d'un handicap visuel, auditif ou cognitif. Il a été constaté que les systèmes de communication s'adressent pour la plupart aux voyageurs adultes, de bonne constitution et ayant des facultés visuelles et auditives supérieures à la moyenne.

Des modifications s'imposent, mais comment y arriver? Comment se sortir du dédale administratif et procédurier incroyable dans lequel doit s'engager toute personne désireuse d'améliorer la signalisation visant les voyageurs handicapés? Ce rapport a pour objet de dégager et de décrire les procédures et autres questions reliées à la mise en place de la signalisation et des systèmes de communication dans les installations terminales - gares routières, maritimes et ferroviaires, aérogares - s'adressant en particulier aux voyageurs souffrant d'un handicap visuel, auditif ou cognitif.

Le rapport s'attaque à un certain nombre de questions dans l'optique particulière de cette catégorie de voyageurs. De quoi a-t-elle besoin? Qui sont les principaux intervenants? Comment obtenir qu'une signalisation soit modifiée? Quels sont les obstacles? Comment mesurer le résultat d'une modification? Quelle est l'autorité qui régit et celle qui doit faire respecter les normes en vigueur ou les normes proposées/adoptées?

Après avoir fait remarquer que la plupart des normes relatives à la signalisation découlent de celles publiées au préalable par l'Association canadienne de normalisation, (ACNOR), le rapport recommande que toute nouvelle norme ou modification à une norme soit examinée par l'ACNOR avant de recevoir d'elle le statut de norme nationale.

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- Architectural and Engineering Services, Public Works Canada
- Transportation Services for Disabled Persons, National Transportation Agency
- Passenger Policy & Programs Branch, Transport Canada
- Airport Operational Requirements Branch, Transport Canada
- Safety and Technical Services Directorate, Transport Canada
- United States Architectural and Transportation Barriers Compliance Board
- The Airport Terminal Managers in Calgary, Edmonton, Halifax, Montreal, Toronto, Vancouver, and Winnipeg
- The Bus Terminal Managers in Calgary, Montreal, Regina, Saskatoon, Toronto, Vancouver, and Winnipeg
- Via Rail Canada Inc.
- Marine Atlantic
- Canadian Standards Asssociation
- Canadian National Institute for the Blind
- Canadian Hearing Society
- Western Institute for the Deaf and Hard of Hearing

SUMMARY

Recent studies sponsored by the Transportation Development Centre of Transport Canada have identified the lack of appropriate signage as a major issue in meeting the needs of travellers with visual, hearing or cognitive disabilities. Much of the signage and related communication systems are designed for the able-bodied adult with above-average vision and hearing. Better systems, that would complement the existing information systems, such as a visual display of auditory messages, are required

In the implementation of any new information signage or communication system, however, there are a number of considerations -- not the least of which are understanding the roles and responsibilities of the organizations involved, and ensuring that the proper procedures have been followed to provide conformance with the published standards and requirements. Different organizations have different requirements, some of which may even be contradictory to each other and to the special needs of persons with disabilities. Various published standards may or may not be used. And the requirements and specifications are not always followed by the authorities responsible for implementing the signage.

Changes are required but the procedures involved in change are not well understood. Concerned individuals wishing to change signage systems for travellers with disabilities face a bewildering array of organizational and procedural hassles. The purpose of this report is to identify and describe the procedures and other considerations involved in the implementation of new information signage and/or communication systems in transportation terminals, such as airport buildings, ferry terminals, bus and railway stations, for persons with visual, hearing or cognitive disabilities.

This review of the process, procedures and requirements for new information signage and/or communication systems, focuses on the needs of persons with visual, hearing or cognitive disabilities: What do they need? Who are the major actors? If a change is required, how is it done? What are the hurdles? If change is accomplished, how is success measured? Who regulates and enforces conformance with established and/or proposed standards?

The report defines and reviews the process, procedures and requirements that are currently in effect in Canada for new information signage and/or communication systems for travellers with disabilities. Various published standards are reviewed and compared. Adherence to the standards, from interviews with terminal managers, is noted. Enforcement of the standards is determined from discussions with the responsible authorities. The process of developing new standards is considered in the context of past experience and the need for future improvements.

It is concluded that the Canadian Standards Association (CSA) has the main responsibility for evaluating and approving standards that are usually adopted by other agencies for use in transportation terminals. It is therefore recommended that any agency or organization wishing to implement new information signage in transportation terminals for travellers with disabilities should approach the CSA Technical Committee on Barrier-Free Design under the jurisdiction of the Standards Steering Committee on Public Safety of the Standards Council of Canada with the express purpose of having the new signage system or device approved as a National Standard.

SOMMAIRE

Le Centre de développement des transports de Transports Canada a récemment parrainé des études qui ont révélé l'insuffisance de la signalisation en place dans l'optique particulière des voyageurs souffrant d'un handicap visuel, auditif ou cognitif. En effet, il a été constaté que cette signalisation ainsi que les systèmes de communication qui lui sont reliés s'adressent pour la plupart aux voyageurs adultes, de bonne constitution et ayant une vision et une ouïe supérieures à la moyenne. Cette signalisation et ces systèmes doivent être améliorés par une signalisation complémentaire, qui afficherait, par exemple, les messages auditifs.

La mise en place d'une nouvelle signalisation ou d'un nouveau système de communication passe par de nombreuses considérations, la compréhension du rôle et du mandat des pouvoirs publics concernés et le respect des normes et des prescriptions en vigueur n'étant pas les moindres. Les prescriptions diffèrent selon les ministères et il arrive parfois qu'elles se contredisent les unes les autres et qu'elles aillent même à l'encontre de l'objectif poursuivi. Il existe diverses normes qui sont ou ne sont pas appliquées par les gestionnaires. Qui plus est, les prescriptions formulées ne sont pas toujours respectées par ceux qui sont chargés de mettre en place la signalisation.

Des modifications s'imposent, mais comment y arriver? Comment se sortir du dédale administratif et procédurier incroyable dans lequel doit s'engager toute personne désireuse d'améliorer la signalisation visant les voyageurs handicapés? Ce rapport a pour objet de dégager et de décrire les procédures et autres questions reliées à la mise en place de la signalisation et des systèmes de communication dans les installations terminales -- gares routières, maritimes et ferroviaires, aérogares -- s'adressant en particulier aux voyageurs souffrant d'un handicap visuel, auditif ou cognitif.

Cette revue des procédures et des prescriptions existantes a été faite dans l'optique particulière de cette catégorie de voyageurs. De quoi a-t-elle besoin? Qui sont les principaux intervenants? Comment obtenir qu'une signalisation soit modifiée? Quels sont les obstacles? Comment mesurer le résultat d'une modification? Quelle est l'autorité qui régit et celle qui doit faire respecter les normes en vigueur ou les normes proposées/adoptées?

Le présent rapport passe en revue et explique les procédures et les prescriptions existantes, ainsi que les normes publiées qu'il compare entre elles. Il indique dans quelle mesure ces normes suscitent l'adhésion des gestionnaires concernés, d'après les résultats lors d'interviews et dans quelle mesure elles sont appliquées par les autorités compétentes. Il explique le processus d'élaboration de nouvelles normes dans le contexte de l'expérience acquise et de l'évolution des besoins.

En guise de conclusion, les auteurs du rapport sont d'avis que les normes adoptées par les autorités compétentes dans les installations terminales doivent être au préalable examinées et approuvées par l'Association canadienne de normalisation, (CSA). Ils proposent que tout ministère ou société d'état qui voudrait implanter une nouvelle signalisation s'adressant aux voyageurs handicapés, présente au Comité technique sur l'aménagement pour accès facile de la CSA qui relève du Comité directeur de normalisation de la sécurité publique, Conseil canadien des normes, une demande formelle visant à donner à la signalisation proposée le statut de norme officielle.

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1. INTRODUCTION TO SIGNAGE

The need for consistent identification and improved access for the public makes signage a major element of any transportation terminal as well as an important part of the terminal operator's corporate identity. Signs are not just graphics; they function in the context of the environment and thus inform users. When well planned and implemented, signs function as part of an environmental information system. Planning such a system involves factors related to human behaviour, information processing and the environment. It therefore calls for an interdisciplinary approach.

Signs serve to identify, inform, direct, warn or regulate. They must convey a message clearly, be consistent with accepted design standards and be placed effectively; that is, they must be conspicuous, legible and understandable. Communicating through signage is considered to be an essential element of both corporate identification and environmental communications. Signage systems are developed to meet the objectives of government policy, the requirements of the organizations using them and, most importantly, the needs of the users for orientation and wayfinding information.

Unfortunately, signs do not always serve their intended purpose. To make the right decisions during their travels in a transportation terminal, people need the right information at the right place and in the right form so that the information can be understood and acted upon quickly. If one of these three elements is missing, travellers will have problems in getting around the terminal. Even if all the elements are present, but carelessly displayed, problems will persist. These problems may be a minor irritant for most people, but for people with disabilities it can mean the difference between the confidence afforded by independence and self-reliance and feelings of helplessness.

ENVIRONMENTAL COMMUNICATIONS

Everything that can be imparted in a setting (or that one may wish to know) falls into one of three types of environmental communications: general information about the setting, directions to destinations, or identification of destinations.

Information Type	Description	Examples
	Information about the setting showing where destinations lie; orientation of visitor to location in the setting Hours of service Do's and don'ts Warnings	Maps, exploded views plans (at entrance points) Directory (beside maps) Signs (beside doors) Regulatory signs (as appropriate)
	Information to guide visitor to destination	Directional signs (at decision points) Attendants (at information desks) Self-help telephones (entrances and/or decision points Reference points (architectural and other features)
	Information to confirm to visitor that they have arrived at the destination	Identification signs (as appropriate) Objects themselves do not need signs (if recognizable and nameable)

Exhibit 1: **Basic Environmental Information Types**

The term *wayfinding* refers to ways of getting around a building. To reach a destination, people must make decisions based on information that may be:

- verbal (notably the information desk);
- graphic (signs, symbols, directories, maps);
- architectural (entrances, stairs, elevators, doors, textures, sound); or
- spatial (how things relate spatially to each other).

The terms *environmental communications* and *wayfinding information* may be used in this report to replace the more common term *signage*. While signage is an aspect of environmental communications, the use of the term is misleading since information used for wayfinding in the built environment consists of more than just signs. There is no guarantee that signage alone will lead to a destination. Other alternatives must often be sought.

For example, the commissionaire at an airport is a vital source of information or environmental communication. So is the building itself and its layout. Stairs or elevators, for example, communicate the way to other levels without any signage at all. Environmental communications can also include visual aids such as graphics, maps, directories, symbols, letters, and spoken messages.

COMMUNICATION INTERACTIONS

Every environmental communication system consists of several components that must be coordinated in their content, form and media. Content, form and media are the irreducible, basic components of all communications.

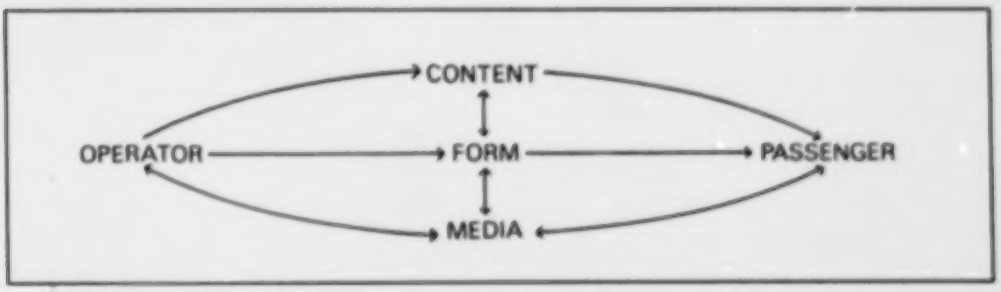
The *content* is primarily what is being expressed, directly or obliquely; it is the character of the information, the message. The message is composed with a purpose: to tell, express, explain, direct, inspire, affect.

The *form* is the method of presentation: the design and arrangement of the basic elements of the message.

The *media* is the location and method of conveyance of the message. It is the interface, the channel of communication between the articulator and the audience.

Form is affected by content; content is affected by form. The message is cast by the responsible authority; it is received and interpreted by the audience.

Exhibit 2: **Information components**



The content can be differentiated by the level of specificity of the information provided -- varying from quite general information about the transportation terminal to specific flight or train schedule information and even current real-time operational information.

The form of the information can be abstract, symbolic or literal. These are essentially different degrees of explicitness. Various forms can be combined to meet the needs of different users, as well as to reinforce the content of the message. For example, visual symbols can be used to direct passengers to locations where more literal and explicit information is provided. Abstract forms, such as colours, textures and illumination, reinforce other forms of information.

The media is differentiated by the level of interaction afforded the audience -- passive, active or interactive. Printed media is considered a passive or static type of media; displays, signs and audio signals may be passive or active; and personal interaction and some automated electronic display systems can be considered interactive.

THE IMPORTANCE OF SIGNAGE

Orientation and wayfinding in a transportation terminal are important but sometimes unnecessarily problematic tasks for travellers with disabilities or communication difficulties. As a result of certain functional limitations, they may depend heavily on their mental image of the environment, their *cognitive map*, and whatever landmarks and cues are useful to them.

A cognitive map is a sort of mental road map that represents the environment. Yet it is also different from a road map in that it varies from person to person and may be distorted and personalized. Also strategies for developing and using cognitive maps vary from person to person. Visually and cognitively impaired people who are just getting to know a facility typically use a *sequential* strategy for finding their way. For example, to get from the entrance to a ticket counter, a visually impaired person may not know the overall spatial relationship of the terminal, but may be able to find the way by following a memorized route from a specific entrance. This sort of sequential strategy emphasizes a string of landmarks without providing the relationship between them.

Sequential Understanding

Sequential understanding can be compared to considering a building in terms of its destination routes. When we travel the routes, we require environmental information. In buildings, these routes are formed by vertical and horizontal circulation (corridors, elevators, stairs, etc.). Routes in buildings require, among other information, signs. For successful wayfinding, signs have to be presented in a particular way. This has to do with how we assimilate information when we are finding our way around.

We do not all have good vision, yet environmental communication is almost entirely based on the assumption that it will be read with normal vision. It is only now that we are beginning to respond to the needs of those who rely on touch and sound, i.e., persons with visual and cognitive impairments. The sound of elevators, for example, is information for people who can't see; a large entrance hall may also contain sounds that, for people who are alert to it, indicate how large the space is that they have to traverse. Other sounds and cues can indicate the locations of restaurants, shopping and so forth. To provide assistance in sequential wayfinding, large signs, effective lighting, and other visual strategies are important.

Alternatively, a traveller may use a cognitive map that incorporates an understanding of the interrelationships between points in the environment. In general, this interrelated strategy is built up over time. Many travellers begin by learning paths and landmarks, then build them into an integrated whole. They develop a *spatial understanding* of the building's environment, usually after some experience and a number of trips through the transportation terminal.

Spatial Understanding

Spatial understanding refers to the total dimensions of the building; its walls enclose space while elements such as escalators, elevators, etc., help to break up the space. People notice and remember these objects as they move about a building.

The building's organization principle, another component of spatial information, describes the architectural layout of the building. This arrangement may be in the form of a square, a rectangle, a "U", a "Y", a cross, etc. To be useful as wayfinding information, the organization principle must be visible from the outside, expressed in the shape of the walls, and from the inside, when entering the building. The organization principle is normally communicated by using a display of an information map of the building. The combination of elements and organization principles helps a visitor create an image. This notion of imagery is extremely important in wayfinding.

The difference between using a *sequential understanding* and a more integrated cognitive mapping strategy with a *spatial understanding* is in the flexibility the two strategies permit. Consider the problem with following sequential directions of the "turn left at the second corridor" variety. When the instruction-giver has forgotten a turn, or when there is a detour, it is very easy to get lost. If the traveller knows the building well and understands the relationship between areas, it is easier to change the route when necessary.

This raises the importance of good environmental communications for travellers with disabilities. First-time users of a transportation terminal may find *sequential* wayfinding easiest. Terminals can provide for this by supplying clear signs and landmarks that people can follow in a point-to-point strategy. Travellers who are more familiar with the setting may find *integrated* cognitive maps more usable. Buildings can provide for this by employing tactual and visual graphics and simple circulation patterns that allow an overall understanding of the building. People with visual difficulties need sequential and spatial wayfinding information, such as a textured path to the information desk where verbal information can be obtained from the attendants.

An environmental communication system designed for wayfinding is based on two fundamental aspects in understanding buildings. One is called spatial; the other is called sequential. Both are important in environmental communications.

2. RESPONSIBLE AUTHORITIES

One of the greatest factors affecting the implementation of any new information signage to meet the needs of individuals with disabilities is the lack of uniformity among ownership, operation and corporate policy within the various transportation terminals. There is no single authority responsible for the design and implementation of effective orientation and wayfinding systems. And there is no single authoritative standard to guide the terminal operators. Instead, a rather complex collage of authorities is responsible and a number of individual standards are applied.

Transport Canada has some say in the legislation and regulation of transportation. The interpretation and implementation of this regulation is, however, in the hands of the individual terminal operators. Transport Canada's presence in some facilities has also been limited for the most part to airports. As well, this presence has been downgraded in the last few years.

An interesting example is the current situation at Toronto's Pearson Airport. In Terminal 1, Transport Canada is responsible for all 'customer service' such as paging, flight announcements, overhead video monitors, and the staffing of information booths. Terminal 2, however, is operated by Air Canada. And Terminal 3, when opened, will be operated by private enterprise. Each separate terminal operator tends to rely on standards developed for the Government of Canada's Federal Identity Program (FIP), but these are used as guidelines only.

Other modes are even more complex. Rail stations are the property of no fewer than four independent agencies -- Canadian National, Canadian Pacific, Toronto Terminal Railway and VIA. As for ferries and bus operation, these services do not operate under the same set of Transport Canada regulations and guidelines.

RESPONSIBLE SIGNAGE AUTHORITIES

The major national and international organizations involved in the development and implementation of information signage for public information used in transportation terminals are outlined in the following exhibit. Other organizations, such as the International Civil Aviation Authority (ICAO) and Marine Atlantic are also involved peripherally.

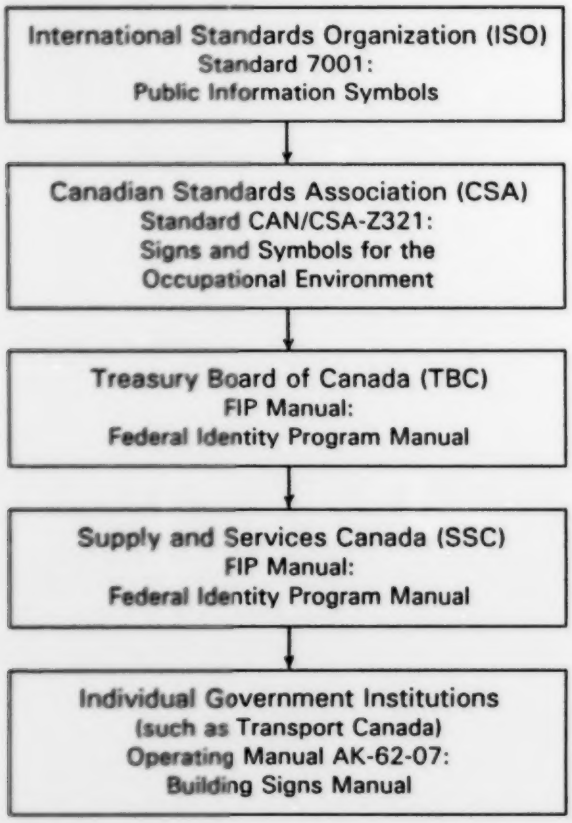


Exhibit 3: **Responsible Signage Authorities**

The exhibit also illustrates conceptually the flow between the various standards that are applied in transportation terminals. In essence, the design and implementation of information signage at individual terminals is performed in conformance with that terminal's operating manual. The terminal's operating manual is derived from the Federal Identity Program Manual. The FIP Manual is derived from information developed by the Canadian Standards Association (Public Works Canada is involved in the development of the CSA Standards) which, in turn, is derived from the International Standards published by the International Organization for Standardization.

As can be seen, there is a lack of uniformity among ownership, operation and corporate policy relating to signage. There is no single authority responsible. And there is no single authoritative standard to guide the terminal operators. Instead, a rather complex collage of authorities is responsible and a number of individual standards are applied. The responsible signage authorities include:

- *International Organization for Standardization (ISO)* which attempts to coordinate international activities, promote cooperation in the area of standardization, and develop standards for national and international acceptance.

- *Canadian Standards Association (CSA)* which approves standards prepared by organizations accredited by the Council, promotes their use as National Standards of Canada and ensures that Canada's requirements for new standards are promptly met.

- *Treasury Board of Canada (TBC)* which is responsible for developing Federal Identity Program (FIP) policy, design standards and implementation plans in consultation with the Treasury Board Advisory Committee on the Federal Identity Program.

- *Supply and Services Canada (SSC)* provides consulting services on graphic design and corporate identity, and supplies various services and materials related to signage in accordance with FIP and Canadian Standards Association standards.

- *Individual Government Institutions*, such as Transport Canada, the National Transportation Agency, and Public Works Canada. Transport Canada's Airport Operational Requirements Department applies an operating manual containing various signage standards which are related to the FIP standards. The National Transportation Agency is responsible for monitoring and enforcing the application of signage standards. Public Works Canada cooperates with the Canadian Standards Association in the development of new standards.

Other agencies involved include in the design and implementation of orientation and wayfinding systems in transportation terminals include:

- *Carrier or Terminal Operators*, such as Marine Atlantic, Via Rail, Air Canada, Canadian Airlines International, Greyhound and Voyageur bus lines, which may have developed their own internal corporate signage standards for application in transportation terminals.

- *Agencies of/for Persons with Disabilities*, such as the Canadian National Institute for the Blind (CNIB), the Canadian Hearing Society and the Learning Disabilities Association of Canada. The CNIB, for example, has prepared and published a set of design guidelines for meeting the access needs of blind and visually-impaired travellers in transportation terminals.

THEIR ROLES AND RESPONSIBILITIES

International Organization for Standardization (ISO)

The International Organization for Standardization (ISO) attempts to coordinate international activities and promote cooperation in the area of standardization. The general purpose is to increase the interchangeability of products and to promote uniformity of definitions of product characteristics.

ISO is the specialized international agency for standardization. Its members are the national standards bodies of some 90 countries.

The role of the ISO is to develop worldwide standards to improve international communication and collaboration, and to promote the smooth and equitable growth of international trade. ISO work results in international technical agreements which are published as standards.

To fulfill its mandate, ISO undertakes the following:

- promotes cooperation among national standards organizations with a view to coordinating their activities and furthering the development of standards;
- promotes cooperation among the various participatory governments in order to further the use of common standards and codes;
- ensures that requirements for new standards are met, and that appropriate expertise is retained to undertake certification and testing of standards;
- informs participatory governments and other agencies about the standards.

With respect to signage and communication systems, ISO has developed a number of highly relevant standards. ISO Standard 7001 specifies the image content of graphical symbols used for public information. ISO 9816 specifies procedures for the development and testing of public information symbols and ISO/TR 7239 specifies a number of definitions and principles concerning the development and application of public information symbols.

Canadian Standards Association (CSA)

In most industrialized countries, a national organization coordinates and promotes the development and use of standards. In Canada, this is the role of the Standards Council of Canada.

The Standards Council of Canada is a corporation created in 1970 by an Act of Parliament of Canada. Its purpose is: *"to foster and promote voluntary standardization in fields relating to the construction, manufacture, production, quality, performance and safety of buildings, structures, manufactured articles and products and other goods as a means of advancing the national economy, benefiting the health, safety and welfare of the public, assisting and protecting consumers, facilitating domestic and international trade and furthering international cooperation in the field of standards."*

The Standards Council of Canada, a Crown corporation and non-regulatory body, is responsible for administering the National Standards System, a federation of Canadian organizations that write standards, test products and services, and certify products to specific standards. The Council works closely with Canadian standards organizations to ensure that national standards are available which answer industry's needs.

In order to fulfill its mandate, the Council is, in particular, authorized to:

- promote cooperation among Canadian organizations engaged in voluntary standardization with a view to coordinating their activities and furthering the development of standards and codes;
- promote cooperation among the above-mentioned organizations and the various levels of government in order to further the use of common standards and codes;
- accredit, in accordance with criteria laid down by Council, Canadian organizations engaged in standards writing, certification of products and services, and testing;
- approve standards prepared by organizations accredited by the Council and promote their use as National Standards of Canada;
- ensure that Canada's requirements for new standards are promptly met, and that there are enough competent certification and testing services to meet the country's needs;
- represent Canada in international organizations concerned with voluntary standardization, and promote cooperation agreements, in the field of standardization, between Canada and other countries;
- inform Canadians about standards and standardization activities.

The Council also ensures that Canada's interests are represented in international standards work. To this end, the System includes two national committees which are responsible for Canadian participation in the work of the International Organization for Standardization (ISO). Part of the General Agreement on Tariffs and Trade (GATT), the Agreement on Technical Barriers to Trade (TBT) -- known as the Standards Code -- stipulates that each signatory must provide an enquiry point. Through a contract with the federal government, the Standards Council of Canada acts as the GATT TBT enquiry point in Canada.

CSA standards reflect a national consensus of producers and users -- including private industry, unions, professional organizations, and governmental agencies. CSA standards, however, are voluntary. Occasionally, instead of developing new standards, municipal, provincial or federal governments use or reference a CSA standard in their regulations.

Several CSA standards are often referred to in relation to signage and/or communication systems in transportation terminals. CSA Standard CAN/CSA-Z321 specifies signs and symbols to be used in the occupational environment and Standard CAN/CSA-B651-M90 contains requirements for making buildings and other facilities accessible to persons with a wide range of physical and sensory disabilities.

Treasury Board of Canada (TBC)

The corporate identity standards of the government are set out under the Federal Identity Program (FIP). The FIP Manual, issued by the Treasury Board, contains sections pertaining to particular applications of the corporate identity as well as sections dealing with general principles of application. The fields of application that are subject to FIP design standards include: stationery, motor vehicles, and *signage*. The objectives of the program are:

- to enable the public to recognize clearly federal activities by means of consistent identification;
- to improve service to the public by facilitating access to federal activities;
- to consider signs as an integral part of the environment;
- to provide a modular system of signage to meet the requirements of users;
- to effect cost savings by standardizing the program's applications; and
- to promote the effectiveness, efficiency and quality of graphic design in all applications of the federal identity.

As with corporate identity programs generally, the Federal Identity Program is based on the use of identifying symbols applied in conjunction with organizational titles. The symbols, organized into systematic formats with distinctive typography and colours, serve to identify organizations as part of the Government of Canada. The policy requires organizations to identify themselves in accordance with standards set for all corporate identity applications, including stationery, forms, printed material, audio-visuals, exhibits, advertising, signage, motor vehicles, watercraft, aircraft and personnel.

The roles and responsibilities of the Treasury Board of Canada pertaining to the Federal Identify Program (FIP) signage are outlined in Chapter 470 of the Administrative Policy Manual of the Treasury Board of Canada Secretariat and are detailed below:

The Treasury Board of Canada is responsible for:

- developing FIP policy, design standards and implementation plans in consultation with the Treasury Board Advisory Committee on the Federal Identity Program and in accordance with the terms of reference for that committee;
- interpreting FIP policy and design standards;
- coordinating implementation of FIP by advising organizations on the policy and design standards.

The Treasury Board Advisory Committee on the FIP has the following terms of reference as outlined in the administrative policy manual:

- to advise and assist the Treasury Board in the development and assessment of policy and design standards as well as the implementation of the FIP;
- to make recommendations to the Treasury Board concerning the development and implementation of policy and design standards for the FIP;
- to consider other matters related to the FIP that may be referred to it by the Treasury Board.

Supply and Services Canada (SSC)

Supply and Services Canada, a common service agency, assists federal government departments and agencies in obtaining various goods and services. It is divided into the Supply Administration and the Services Administration, each under the direction of a Deputy Minister.

The Supply Administration, in general, is responsible for acquiring and providing goods and services to departments; planning and organizing for the provision of materiel and services required by departments; acquiring goods and services from Canadian suppliers on behalf of foreign governments; operating government printing facilities; operating government publishing and exposition services; disposing of federal Government surplus assets; contracting for federal government advertising; investigating and developing services to increase the efficiency and economy of the Public Service of Canada; and implementing the contracting-out policy in science and technology.

Supply and Services Canada (SSC) provides consulting services on graphic design and corporate identity, and supplies typesetting printing, items related to personnel identification, vehicle markings and signage in accordance with Federal Identity Program (FIP) and Canadian General Standards Board (CGSB) standards. The department also monitors implementation of FIP in government advertising and marketing programs.

Supply and Services Canada is responsible for:

- supplying all FIP signage, as requisitioned by client organizations;
- verifying correct use of the signature, organizational title, message, sequence of message elements and order of the two official languages;
- preparing a sign layout, as required, in accordance with FIP policy and design standards;
- providing a client organization with a copy of the layout for the proposed sign and a firm cost quotation for fabrication;
- fabricating or procuring the sign in accordance with the client-approved layout and all applicable Canadian Standards Board (CGSB) standards;
- delivering the sign within the time periods set out under "source of supply";
- installing the sign if requested by the client organization;
- providing a consulting service with expertise in sign message organization, integrated signage systems, and siting and installation requirements;
- providing to client organizations a catalogue, order forms and price lists to facilitate the procurement of signs.

Supply and Services Canada, therefore, oversees production of signs (design and fabrication) for federal government agencies. During this process, the FIP design standards are followed and specifications for placement (for example, height of sign) are accommodated. Consideration is given to deviations from the standards such as the placement of braille signs at a lower than specified height. The agency, however, has no responsibility in the design and implementation of new standards for signage and/or communication systems.

Individual Government Institutions

Individual government institutions are responsible for the implementation of the FIP policy in their organizations. Each institution identifies to the Treasury Board Secretariat the official who is authorized by the deputy head to manage the organization's corporate identity. Referred to as the FIP coordinator, and acting on behalf of the deputy head, the official is responsible for ensuring that the organization is in full compliance with FIP. They are responsible for:

- determining its signage requirements in accordance with FIP policy and guidelines;
- procuring from SSC all primary identification signs, directory boards, common-use and operational signs;
- determining the message of signs in both official languages;
- as required assisting other federal organizations in coordinating the requirements for primary identification signs, directory boards and common-use signs;
- approving the size, location and placement of all signs under their direct responsibility, as well as those client operational signs that are to be placed in common areas (interior or exterior) of a facility;
- arranging for the removal of obsolete or redundant signs.

Normally, the management of an organization's corporate identity is associated with the communications or public affairs function. In view of the different fields of application of corporate identity, the FIP coordinator has the authority to assign responsibility for implementation and maintenance of FIP throughout the organization. On the air side, the responsibility is assigned to the terminal services superintendent for the airport.

Transport Canada (TC)

Transport Canada is the federal government's department of transportation with responsibility for all modes of transportation under federal jurisdiction which includes air, rail, marine and some intercity bus services.

On the air side, the Federal Identity Program coordinator has assigned the responsibility for implementation and maintenance of signage to the terminal services superintendent for the airport. In most cases, the terminal services superintendent uses the FIP standards (other standards mentioned by terminal operators include Transport Canada's AK standard). In the odd instance, changes from the FIP standards may be used, such as the replacement of pictographs with 'raised glyphs' for visually-impaired persons in Calgary. Local decisions on placement are made by the terminal operations staff. Sometimes assistance is sought on barrier-free design from local advisory committees composed of various user groups. A facilities alteration permit is required from Transport Canada Airport Operational Requirements when implementing internal changes in the terminal.

Transport Canada's Airport Operational Requirements Department states that they used the Transport Canada AK standard but that it is soon to be replaced by a new CSA standard. This new standard will be used for all airports, whenever new signs are installed or modifications made. The new standard does not have any specific relation to the FIP standards. Non-federal government terminals will likely use the new CSA standards. A national committee chaired by the Airport Operational Requirements Office of Transport Canada is also starting to develop a training guide for coordinators of major federal programs, that will be helpful for new terminal managers involved with design of signage and barrier-free facilities.

National Transportation Agency (NTA)

Prior to 1987, those modes of transportation which were under federal jurisdiction were under the regulatory authority of the Canadian Transport Commission. Amendments were made through Bill C18 to the National Transportation Act in 1987 that transferred to the National Transportation Agency powers of the Canadian Transport Commission to regulate accessibility on airlines.

On July 7, 1988 another amendment, Bill C-131, was made to the National Transportation Act, 1987 to empower the Agency to regulate accessibility for persons with disabilities to all transportation modes under federal jurisdiction. Draft standards which may provide the basis for regulations were developed by Transport Canada and were turned over to the Agency for its consideration in the development of regulations. The National Transportation Agency (NTA) is currently developing signage and accessibility standards for application in transportation terminals. Individual transportation terminal operators will be responsible for implementing these standards, but they will be monitored by the National Transportation Agency.

The relationship between the NTA standards and the existing FIP and CSA standards is not clear at the present time. It is anticipated that the NTA standards will be similar to the FIP and CSA standards. The NTA will publish their standards and monitor their usage. They have the authority to fine agencies that do not use the standards properly.

In summary, implementation of information signage is the responsibility of the local terminal authorities who use existing FIP and CSA standards fairly rigorously, as well as other documents produced by CNIB and other interest groups. These 'user group documents' used as guidelines only but are being considered by the Canadian Standards Association for inclusion in the CSA standards. It is anticipated that existing standards will eventually be replaced in all transportation terminals by the Canadian Standards Association's CAN/CSA-B651-M90 barrier-free design standards.

3. AUDIENCE REQUIREMENTS

People in general need adequate information to make the right decisions to reach their destination. This means: (1) all the right information; (2) at all the places where decisions must be made; and (3) in the right form so that the information can be understood. If one of these three elements is missing, visitors may have problems with the information being supplied in the transportation terminal.

Even if all three elements are evident, but glare makes signs illegible or they have been carelessly displayed (e.g. too high/low, etc.), people may have difficulty in finding or reading them. People with normal sight will experience problems under these circumstances, however, those with low vision may find it impossible to get the information. This represents another reason for people to give up on signs, and to go instead to the nearest official (or commercial vendor) to ask for directions.

Most individuals with disabilities lead active, independent lives. They manage to find their way through confusing and complex environments. However, some are not so skilled as travellers and are much less independent. For these people, the environment can be confusing and hazardous, and special design attention is required to make transportation terminals accessible to them.

Much has been done in recent years to help people with disabilities, particularly in trying to create barrier-free architectural spaces. Much remains to be done, however, to assist the invisibly disabled whose limitations are not necessarily apparent. This reference is made for those who are sight- or hearing-impaired, or who have other perceptual or cognitive impairments. The final question is simple: Does the environmental communication system allow these people to travel more independently, more safely, and more purposefully?

TRAVELLERS WITH PERCEPTUAL IMPAIRMENTS

Sight-Impaired Traveller Needs

Recognizing persons with visual limitations requires a thorough understanding of blindness, which does not always mean total loss of sight. Sometimes the person who is 'legally blind' can see a little. Some persons can distinguish only the difference between light and darkness; others see in a mist as if a thick white curtain were always in front of their eyes. Still others have peripheral sight, seeing only the edges of shapes, and others have pinhole sight, with everything blocked off but a tiny speck of light. According to the Health and Activity Limitation Survey, about 553 000 Canadians, or 18.2 percent of those reporting a disability, are visually impaired.

Many aids are available to blind and partially sighted persons, but none restores sight. Instead, they use partial vision and/or other senses to enable them to read, write, obtain information and participate in visually-oriented activities.

Persons with sight impairments have poor eye-sight that can manifest itself in many ways -- from being colour blind to having no useful vision whatsoever. A common and much overlooked form of visual impairment is 'low vision', a category in which some one percent (including the totally blind) of all Canadians fall. Low vision people with some useful vision can see signs but must be able to get close to them. Even then, the signs must be in large letters and have excellent contrast between the letters and the background.

All these needs should be recognized and considered when seeking ways of providing wayfinding information in transportation terminals:

- excellent contrast between the letters and the background;
- good light levels wherever there are signs (if you can't read a newspaper right beside a sign, the sight impaired can't read the sign);
- no glare (from varnish or gloss or from a shiny surface on the signs);
- location between the 1300 mm and 1600 mm levels;
- avoid mixing certain colours (particularly red and green) in signs because people with colour blindness (or deficiency) cannot distinguish between them and it will look grey;
- visually impaired or blind people may rely on touch for their interpretation of signs which means they must be tactile: in Braille cells and/or raised letters. One day all signs may be made with letters raised 1 mm off the background of the sign; right now, however, this is mandatory only on both jambs of elevator doors, in elevator car controls, and stairwell signs;
- directional guides from entrances to information desk;
- verbal or tactile information about building layout;
- telephone service providing directional information to the building, and to the information booth;
- auditory identification cues inside and outside elevators;
- verbal and tactile information about major facilities, e.g., washrooms, telephones, cafeterias.

Hearing-Impaired Traveller Needs

Hearing-impaired persons represent as much as 10 percent (including .02 percent totally deaf) of our population. According to the Health and Activity Limitation Survey, hearing disabilities are experienced by an estimated 973 830 individuals in Canada, of whom 168 000 cannot hear a conversation over a standard telephone, even with the use of a hearing aid.

Today, through technology and intensive training, some congenitally deaf persons can learn to speak, yet sign language continues to be the preferred mode of expressive communication among the deaf. Assistive devices and aids include: hearing aids, sign language, written language, telecommunications devices and guide dogs. Hearing impairment is one of the 'invisible' disabilities, because it is often difficult to recognize individuals with hearing impairments.

Although this group has no problems with reading signs, if they do not understand them or if they become lost, they may well be too shy to ask questions. Many hearing-impaired persons also cannot hear a fire alarm or emergency announcement. The following will assist these individuals:

- attendants at information desks (and/or at reception desks) should be aware of the need to speak slowly and distinctly, and to look the visitor directly in the face while being careful not to cover the mouth; attendants also should have note pads handy;
- self-help and other public telephones fitted with the necessary fluxcoil (a relatively simple conversion) that makes them usable by means of the "T" switch on most hearing aids;
- avoidance of acoustic masking interference from noisy lighting fixtures, etc.;
- lighting should not throw shadows onto the attendant's face, causing problems for lip-readers.

Speech-Impaired Traveller Needs

Speech-impaired persons account for approximately .05 percent of Canadians and 4.7 percent of the population with disabilities, according to the Health and Activity Limitation Survey.

Although this group has no problems with reading signs, if they do not understand them or if they become lost, they also may be too shy to ask questions. Their trouble in asking questions will often result in difficulty in getting much-needed information.

All these needs should be recognized and considered when seeking ways of providing wayfinding information in transportation terminals:

- a pad and a pencil at the information (and/or reception) desk;
- an understanding attendant, Commissionaire or receptionist;
- a familiarity with Blissymbols used by many of the speech impaired to communicate and ask questions.

TRAVELLERS WITH COGNITIVE IMPAIRMENTS

Literacy-Impaired Traveller Needs

Literacy-impaired persons constitute up to 20 to 25 percent of our adult population. Even if a sign is perfectly legible because of the size of the letters, this group may not be able to read it. The problems of travellers with illiteracy or foreign language difficulties can be considered in this context. Their needs also have to be recognized in wayfinding and orientation systems:

- pictures (symbols) make the words easier to understand;
- plain language in signs, simple and as few words as possible;
- spoken language is the best of all; try the self-help telephone.

Cognitively-Impaired Traveller Needs

Developmentally-impaired persons experience other difficulties with environmental communication that are not directly connected with vision, hearing, literacy, or speech problems. This large group comprises persons with a wide variety of disorders. Estimates of learning-disabled persons run as high as 10 percent of our population, and mentally-impaired persons account for 4 percent.

Persons with cognitive disabilities may have trouble absorbing aural information and/or processing that information; they may experience an involuntary reaction to too much information; they may have trouble distinguishing directions or remembering specific facts; and they are easily distracted by crowds and noise.

Cognitive problems are complex and varied, manifested by delays in the development of, or difficulties in, the functions of attention, memory reasoning, co-ordination, communicating, reading, writing, spelling, calculation, social competence or emotional maturity. Inherent in the definition of persons with cognitive disabilities, these persons would likely be affected considerably by deficiencies in traveller information systems.

Situationally-impaired persons are those who would, under other circumstances be described as 'unimpaired'. Due to a stressful situation they may be apprehensive or angry at having to be in the building at all, and become situationally-impaired. The visitor will consequently experience difficulty with signs, no matter how good they are. For obvious reasons, there are no data on the situationally-impaired, however, it is fair to say that all of us will be, or have been, in this situation at one time or another. Assistance can be provided by:

- common sense and understanding from the attendant, commissionaire or receptionist;
- some training of the above staff in dealing with these problems;
- redundancy which involves saying things in different ways until the visitor acknowledges that they understand;
- plain language in signs, simple words, and as few of them as possible;
- consistency in the display of signs.

TRAVELLERS WITH MOBILITY IMPAIRMENTS

Mobility-Impaired Traveller Needs

The last group comprises mobility-impaired persons, either those in wheel chairs or those with ambulatory problems. Because of age, illness or accident, they may have difficulty in walking and may be concerned about going any distance to read a sign. They will also want reinforcement or confirmation that once they set out to a destination, they are in fact going in the right direction.

Important criteria for this group includes:

- letters that are a minimum of 22 mm high everywhere so they don't have to cover more ground than necessary to see what a sign says;
- ability of persons in wheelchairs to get relatively close to the signs without barriers between them and the signs;
- consistency of display of signs (placement, colour, format);
- signing of accessible routes;
- physical access for everyone to maps, directories, and information services;
- avoidance of glare off all signage elements (note that the potential for glare is different due to a lower eye height).

It is worth bearing in mind that some of the visitors will have multiple handicaps. A deaf person may also use a wheelchair, for example. This stresses the importance of your environmental communications system in being able to accommodate itself to the wayfinding needs of the disabled people, as well as those of the able-bodied.

When we think of information in a public building, we tend to think of something highly complex and involved. This may be because of all the different sorts of questions people ask, or the ways in which buildings differ form each other and so on.

But in actual fact, it is can be simplified. There are no more than three types of information that anyone in a public building requires. Everything that can be imparted in a setting (or that one may wish to know) falls into one of three types of environmental communications: general information about the setting, directions to destinations, or identification of destinations.

4. ENVIRONMENTAL COMMUNICATIONS

The term *wayfinding* refers to ways of getting around a building. To reach a destination, people must make decisions based on information that may be verbal, graphic, architectural, or spatial. The terms *environmental communications* and *wayfinding information* are used to replace the more common term *signage*. While signage is an aspect of environmental communications, the use of the term is misleading since information used for wayfinding in the built environment consists of more than just signs. There is no guarantee that signage alone will lead to a destination. Other alternatives (for example, maps and verbal information) must often be sought.

During all phases of transportation facility use -- planning, moving through the terminal and on board -- there is a constant need for relevant, easy to understand information -- information about orientation within the facility, wayfinding around the facility and procedures to follow to complete a trip. This information is an essential part of the travelling process and it must be conveyed in a method that is easily understood by all transportation facility users; including, especially, travellers with impairments.

These travellers rely heavily on information cues to guide them through a transportation facility. In many instances, information is conveyed only one way, either visually or orally, but rarely both. And in some instances the information conveyed is not clear.

The most common forms of environmental communications include signage and symbols (textures, colours, shapes and lighting probably need more consideration). Therefore, in this chapter, a review is provided of the signage system and the symbol set as outlined in the Federal Identity Program Manual.

THE FIP SIGNAGE SYSTEM

The system was developed as an integrated set of signs to meet the requirements of all organizations subject to the Federal Identity Program. Many variables that make up these requirements were considered during the development phase. In addition, the existing standards and practices (in Canada and other countries) pertaining to architectural signage were reviewed. During the design phase, an effort was made to achieve a system that would be visually compatible with the architecture of most facilities.

Excluded from this system are any signs that may be subject to regulations (such as traffic signs which are subject to the *Manual of Uniform Traffic Control Devices for Canada,* or emergency exit signs, which are prescribed by the *National Building Code*).

The FIP signage system is a set of general guidelines based on the common needs of government organizations. It recognizes that signs are not just graphics; they function in the context of the environment and thus inform users. When well planned and implemented, signs function as part of an environmental communication system. Planning such a system involves factors related to human behaviour, information processing and the environment.

Signs serve to identify, inform, direct, warn or regulate. They must convey a message clearly, be consistent with design standards and be placed effectively. Communicating through signage is considered an essential element of both corporate identification and environmental planning.

System Development

A FIP Standing Committee on Sign Development has been established to develop and maintain the design standards for the system and to recommend to the Treasury Board Advisory Committee any revisions to the FIP system.

Enquiries should be directed to the FIP Standing Committee on Sign Development, c/o Administrative Policy Branch, Treasury Board of Canada.

Design Standards

The FIP signage system is based on FIP design standards which prescribe the use of symbols, colours, signage typeface, and layout. All signs must conform to the approved design standards and to the pertinent specifications or standards for sign materials.

Graphic Components: To achieve visual coherence, standard graphic components have been adopted. The use of these components results in a 'visual language' particular to the signage system. The components include:

the corporate symbols; the characters of the signage typeface; the directional arrow; and the set of graphic symbols. All of these components are defined in the FIP signage system.

Types of Signs

The signage system is comprised of four main types: primary identification; common-use; operational; and project. The terms 'common-use' and 'operational' reflect the responsibilities for signs based on application.

Primary Identification Sign. The first sign that identifies a federal facility and bears the signature and the wordmark is known as the primary identification sign. Depending on the type of facility and its location, it may be an exterior or an interior sign. A sub-type of the primary sign is the advance sign. It may be required to indicate distance or direction to a facility that is located off the main thoroughfare or farther along the road.

Common-use Sign. A common-use sign is related to the facility itself, a sign that would be required regardless of changes in occupants. This type includes directory boards, and signs bearing words, a graphic symbol, or both.

Operational Sign. An operational sign relates to the operational needs of the occupant organization and is normally located within the space in which the organization operates. This type of sign bears words, a graphic symbol, or both.

Project Sign. A project sign provides on-site information on government programs or projects, such as employment, public works or housing. It generally has a limited life span of up to two years.

Catalogue of Signs

To meet the general requirements of the government, many of the commonly used signs have been standardized and form part of the FIP signage system. The *Catalogue of Signs*, issued by Supply and Services Canada, lists the items for which a standard design has been adopted.

Fields of Application

In general, the fields of application for signs are divided into public areas and occupational environments. This division reflects two groups of users: the general public and government employees.

The public areas include all facilities and sites to which the public has access or where services are provided directly to the public. The signs serve to direct and to inform people who are unfamiliar with the facility.

THE FIP SYMBOL SYSTEM

The Government's Set of Symbols

Described here is the set of graphic symbols adopted by the Government of Canada. It was first published in 1980 under the title "Graphic symbols for public areas and occupational environments". Developed for government-wide use in the FIP signage system, the symbols are intended to meet the general requirements of federal institutions.

During initial development, the existing standards and practices in Canada and other countries were reviewed. The principles established by Committee Z321 of CSA (Canadian Standards Association) and Committee TC145 of ISO (International Organization for Standardization) were adopted, and the following national and international standards were applied:

- CAN CSA-Z321, Signs and Symbols for the Occupational Environment;
- ISO 7001, Public Information Symbols.

The set of symbols, illustrated in the exhibit opposite, is based on consistent use of geometric shapes and specific colours. These shape and colour codes permit users to distinguish between the six types of symbols. The shape, colour, function and subject area of each type are indicated below:

Class and shape	Type and colour	Function of symbols	Subject area
Regulatory	Prohibition Red and black on white Mandatory White on black	To indicate an order forbidding an action To indicate an order for obligatory action	Access Activities Protective apparel
Warning	Caution Black on yellow Danger White on red	To indicate a potential hazard. To indicate a definite hazard.	Potential hazards Definite hazards
Information	Emergency White on green Guidance and information White on dark grey; or White on blue	To provide information required in case of emergency To provide general information	Fire fighting equipment First aid General Public services Public transportation Concessions Recreation General

Exhibit 4: **Classification of graphic symbols**

The government's set of symbols is based on the following objectives: to provide users of government facilities with uniform, easily learned and understood graphic symbols; to harmonize the symbols with those developed by national and international standards organizations; to achieve as much visual coherence as possible within the FIP signage system; and to effect cost savings through standardization.

Exhibit 5:
The FIP set of graphic symbols

Design Standards

Design standards prescribe the shape, colour and image content of symbols. Other aspects, such as the size relationship of shapes, the proportion of the border, and the production sizes, have also been standardized.

Size relationship of shapes. A specific size relationship between the three shapes has been established (Exhibit 25). It is based on the need to compensate for differences in the surface area and apparent size of the three shapes. The relationship is as follows:

- diameter of the circle, 80 units;
- base of the equilateral triangle, 100 units;
- height of the square, 75 units.

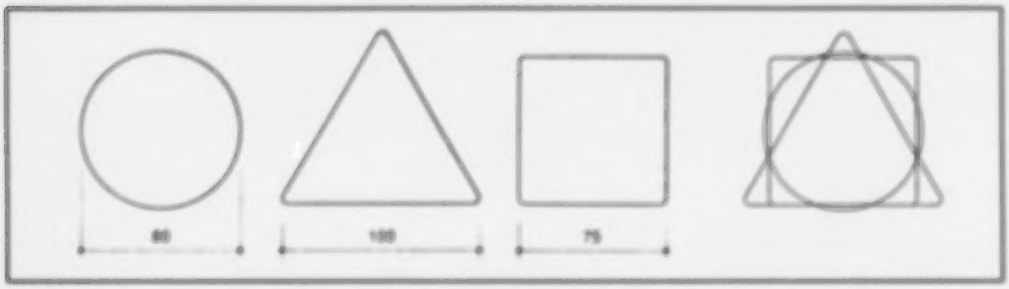


Exhibit 6:
Size relationship of shapes

To establish a simple range of sizes for the symbols, all sizes have been based on the height of the square. Thus, the standard sizes are actual for any square symbol, but nominal for symbols using a circular or triangular shape.

Proportion of the border to the shape. To delineate the shape, all symbols are surrounded by a border 2 units wide. The relative proportion of the border to the shapes is as follows:

- 1:40 for the circle of 80 units measured on the diameter;
- 1:50 for the triangle of 100 units measured on the base;
- 1:38 for the square of 75 units measured on the height.

Standard Sizes

A range of sizes has been established. Exhibit 7 indicates the viewing distance for each symbol size. It should be noted that the values are intended for general guidance only and do not represent a definitive distance/size relationship.

Legibility at a given viewing distance varies owing to differences in the colour, shape and image detail of the different types of symbols. The values shown in the exhibit are based on normal viewing conditions, which means adequate lighting and viewing angles that do not exceed 10 degrees.

Exhibit 7: Viewing distance and symbol size

Viewing distance	Symbol size	Viewing distance	Symbol size	Viewing distance	Symbol size
3-6 m	40 mm	15-18 m	120 mm	36-48 m	320 mm
6-9 m	60 mm	18-24 m	160 mm	38-60 m	400 mm
9-12 m	80 mm	24-30 m	200 mm	60-72 m	480 mm
12-15 m	100 mm	30-36 m	240 mm	72-90 m	600 mm

Note: The symbol sizes are actual for any square symbol, but nominal for symbols using a circular or triangular shape.

Regulatory Symbols

Exhibit 8: Regulatory, warning and information signs

In the FIP symbols set, background shapes such as triangles, circles, and squares have been selected to encode particular meanings. Combined symbols such as slashes for prohibition are also used. The circle is used to convey regulatory messages; prohibition and mandatory symbols.

Prohibition. The prohibition symbol consists of a black image located on a white field, circumscribed by a red ring, and diagonally bisected at 45 degrees by a red slash. The red ring is surrounded by a white border.

The red slash is printed over the black image, and is oriented from top left to bottom right.

The ring and slash of the prohibition symbol have the following proportion to the outer diameter of 80 units:

- 7.5 unit wide ring, 1:10.7;
- 7.0 unit wide ring, 1:11.4.

Mandatory. The mandatory symbol consists of a white image on a black disc, surrounded by a white border.

It should be noted that some researchers believe the prohibition symbol tends to obscure the message -- the forbidden action is often overlooked by the intended audience. It is suggested that a positive symbol would be better visually; but, for some referents, it is difficult to avoid a prohibition symbol.

Warning Symbols

The triangle is used to convey warnings; caution and danger.

Caution. The caution symbol consists of a black image on a yellow equilateral triangle, surrounded by a black border. [Note: CSA standard Z69:1960 prescribes the colour of the image indicating ionizing radiation (symbol 3.1.5) as purple instead of black.]

Danger. The danger symbol consists of an equilateral triangle surmounting a rectangle of equal width. The triangle contains the image and the rectangle the word "Danger". The background colour is red. The image, the lettering, and the border surrounding the triangle and rectangle are white.

Information Symbols

The square is used for emergency information, and for general guidance and information.

Emergency. The emergency symbol consists of a white image on a green square, surrounded by a white border.

Guidance and Information. Depending on requirements, either a dark grey or a blue symbol is used. In general, the colours are applied as follows:

- The dark grey symbol is used for administrative areas where a neutral colour is appropriate. The specifications are: white image on a dark grey square, surrounded by a white border.
- The blue symbol is used for areas requiring a more conspicuous sign colour (public areas, industrial sites or facilities, parking areas). The specifications are: white image on a blue square, surrounded by a white border.

5. ENVIRONMENTAL RELATIONSHIPS

Perception of environmental communication and wayfinding information systems is influenced by numerous physical and psychological factors such as quality of eyesight, reading ability, memory, colour sensitivity, cognitive ability, and mental attitude. While these vary with the individual and are beyond the control of the responsible authority, a general understanding of how these factors affect the viewer's response to signage is important.

Each viewer's perception of and response to signage are conditioned by certain physical and psychological characteristics, referred to as *human factors*.

A traveller walking through a transportation terminal can scan the environment. Signs, along with many other elements within the field of vision, are seen in a generalized way, unless they provide some needed information -- and then they are focused upon. It must be realized that signs compete for the viewer's attention with all other elements in the terminal environment.

When a specific environment can be visually controlled by the responsible authority, the viewer's awareness of the signage system and its effectiveness can be dramatically increased. By using various *environmental factors* such as good lighting and appropriate textures and colours, an appropriate psychological environment can be created to enhance the message.

Some of the important human (physical and psychological) and environmental factors to be considered in implementing new information signage in transportation terminals are discussed in this chapter on the environmental relationships involved in environmental communications systems.

HUMAN FACTORS

A person's perception of and response to a sign are conditioned by certain physical and psychological characteristics, referred to as human factors. The observer's relationship to a sign is an aspect to be considered at the planning stage, and includes factors such as viewing distance, viewing angle, reading time and movement. All have a direct effect on decisions about message length, sign size and sign location.

A separate, but nevertheless related, factor is the relative importance of a specific sign message to the user. An environmental information system must provide a structure or hierarchy to distinguish important or essential information from the many signs that convey useful but non-essential information. Depending on the nature of the message, the factors described here may not be relevant for all signs.

Physical Factors

Normal Field of Vision. Studies indicate that the normal field or cone of vision suitable for signing covers an angle of about 60°. Areas outside the angle tend to be seen in much less detail. For example, if a sign were supported from a high ceiling so that a sight line between the viewer's eye and the horizontal were more than 30°, it would probably be overlooked.

Visual Acuity. Viewers differ considerably in their ability to see clearly. Yet environmental communication is almost entirely based on the assumption that it will be read with normal vision.

Reading Rate. Among the normal reading public, there is a wide variation in individual reading rates from perhaps 125 words per minute to 500 or 600. Factors like age, intelligence and education influence reading rates; the average is about 250 words per minute.

Legibility. Distance studies indicate that under normal daylight when standing still a person with normal 20/20 vision can read 25-mm high letters on a standard Snellen eye chart used by optometrists at a distance of 15 m. For elderly and disabled persons, and to meet broader public needs, a letter height of 25-mm for 7.5 m of viewing distance is probably a more practical guide.

Eye Level. The average height of a viewer's eye level, measured from the ground when the viewer is standing, is about 1.7 m; when sitting, it is about 1.3 m. Sight lines are a very important factor in sign placement and will be discussed further later in this chapter.

Persons with Disabilities. Attention has to be focused on the fact that everyone is not able-bodied and that many people have special communication needs. Much remains to be done to assist the invisibly disabled.

Psychological Factors

Figure-Ground Relationships. Psychologists refer to figure-ground relationships when they talk about how shapes or patterns are perceived against a background. Shapes are delineated by edges and edges are contours in perception. Anything which affects a clear perception of the contours may affect recognition of the object. These concepts relate to how the spaces between letters affect perception and recognition of letters and words. Excessive crowding and shadows from raised letters present problems.

Implications of Colour. Individuals seem to vary considerably in their ability to distinguish and remember colours. Probably only six different colours, not including white and black -- red, yellow, blue, green orange, brown -- can be readily distinguished and remembered by normal viewers. Despite these limitations, colour can be used as a secondary identification element or as a coding device in situations where the number of colours is very limited. For example, Canada Customs and Excise is trying a system using red and green doors at customs areas in airports (red = stop and declare; green = proceed, nothing to declare) similar to European airports. This coding application does not require colour memory when reinforced by numbers or letters.

Certain colours can be powerful reinforcing agents in signing; the viewer has been conditioned to associate red, for example, with danger or emergency through experience. Similarly, we respond to yellow as a warning colour.

Ambiguity of Symbols. The majority of people are verbally oriented, absorbing most information through words, while the minority respond more quickly to visual devices, such as symbols. Most sign systems need some verbal messages; but, most international airports use symbols to reinforce the verbal message or to stand alone. But even one of the most simple symbols, the arrow, can be ambiguous; the difficulty comes when the direction 'ahead' is indicated by an arrow. There can be confusion whether this means down or ahead or up or ahead, depending on the direction of the arrow. Apparently, most sign viewers have adjusted to the fact that an arrow pointing down may indicate 'down' in one situation and 'ahead' in another.

Clarity of Copy. Because certain phrases tend to be ambiguous or subject to personal interpretation, it is important to make sure the message is consistent, stated positively, as short as possible, and means the same thing to all viewers. For example, restrooms may be designated 'Men' and 'Women' or 'Gentlemen' and 'Ladies'. A variety of symbols may have been used. While wording may vary, it is important to maintain consistency within any sign system. The FIP guidelines help to achieve this.

Considering the broad range of human factors, no sign system can communicate equally well with all viewers. However, the constraints imposed by these factors and environmental limitations help define each signing problem and the specific audience that the system is designed to reach.

Perception Factors

Many aspects influence an observer's ability to perceive a specific sign, to read its message and to act upon it. These factors include the viewer's ability to see the sign clearly (physical factors), to understand the sign (psychological factors), and the viewing conditions at the site (perception factors).

Most of the factors may be beyond the direct control of the person planning the size and location of the sign. However, two questions need to be answered: (1) Will the sign be conspicuous enough? (2) Will the sign message be legible? The person responsible for the sign has control over these perception factors.

Whether a sign message will be legible depends on the character size and the distance from the observer. Generally, it is *viewing distance* that becomes the basis for selecting the character size. These factors, which pertain to perception, have a direct impact on decisions concerning sign size and location.

Viewing angle. The viewing angle is the angle formed by the plane of a sign and the observer's central line of vision. Ideally, a sign should be placed at a right angle to the line of vision; that is, the viewing angle should be nearly 90 degrees. The legibility of a sign message deteriorates when the viewing angle is less than 45 degrees.

Viewing distance and displacement. The location of a sign should be planned in relation to the observer's normal line of vision. Displacement is the distance between the centre of a sign and an observer's central line of vision (measured at a right angle to the central line of vision). Ideally, the angle of displacement should be between 5 and 15 degrees (e.g., 0.25 m of displacement per 1.00 m of viewing distance provides an angle of approximately 15 degrees at the eye of an observer).

Viewing distance and character size. The selection of the character size is generally based on the normal viewing distance. Viewing distance, message length, character size, and sign dimensions are interdependent factors that must be considered when planning any type of sign. Intended for general guidance at the planning stage, Exhibit 9 shows the viewing distance and corresponding character size. It represents values applicable to normal viewing conditions and reading distances. The values are based on the signage typeface of the FIP.

Viewing distance	Character size	Viewing distance	Character size	Viewing distance	Character size
1 m	5 mm	12 m	20 mm	48 m	80 mm
2 m	6 mm	15 m	25 mm	60 m	100 mm
4 m	8 mm	18 m	30 mm	72 m	120 mm
6 m	10 mm	24 m	40 mm	90 m	150 mm
7 m	12 mm	30 m	50 mm	120 m	200 mm
9 m	15 mm	36 m	60 mm		

Exhibit 9: **Viewing distance and character size**

ENVIRONMENTAL FACTORS

Many aspects influence an observer's ability to perceive a specific sign, to read its message and to act upon it. These factors include the viewer's ability to see the sign clearly (visual acuity), and the viewing conditions at the site, namely:

- the angle from which a sign is normally viewed;
- the quality and intensity of the light falling on the sign;
- any obstructions of the sight lines between viewer and sign;
- glare from light sources around the sign; and
- the visual environment behind or around the sign (e.g. other, competing signs or distracting elements).

Whether a sign is placed in a natural or an architectural environment, it modifies its surroundings. Signs not only become part of their surroundings, they also 'reflect' on the organization occupying the space. The purpose of signs is to help. They provide a communication system that enables users to function in that space. However, for a variety of reasons, signs tend to detract visually from the surroundings. This is particularly true of oversigning.

For the most part, environmental factors may be beyond the direct control of the designer, but there are closely related design factors which can be controlled. Artificial lighting can be used to increase perception of signs. Signs can be placed to improve sight lines. Most design elements of a sign can be adjusted to improve legibility of a sign, compensating for a poor visual environment.

Ambient Lighting and Illumination

The normal light existing in the environment, or *ambient* lighting, is a primary consideration. Perception depends to a large degree on the quality, intensity and colour of ambient light that falls on a sign. As ambient light levels decrease, contrast between copy and sign backgrounds should increase. In non-illuminated signs, this is achieved by using light copy on dark panels or vice versa. White copy messages on yellow backgrounds where ambient light is low can, for example, be unreadable because of lack of contrast.

Regardless of copy and background contrasts, studies indicate that visual acuity increases in general with an increase in the level of illumination. Also, the speed with which viewers recognize signs increases as illumination increases.

In certain cases, owing to operational or site conditions, special measures may be needed to provide acceptable levels of illumination. The following factors should be evaluated when determining siting and illumination.

Exterior signs. Night-time visibility may be needed to facilitate access to services provided to the public at all hours of the day. A decision on the most appropriate method (front-illuminated, trans-illuminated or use of retro-reflective sign materials) should take into account both energy and cost efficiency.

Interior signs. Available ambient light is normally sufficient to illuminate interior signs. To minimize costs and to avoid additional lighting requirements, the placement of illumination should be coordinated with the siting of signs.

Special (battery-operated) lighting may be needed for signs that must be visible during emergency conditions (such as power failure). It is also important to provide proper illumination for signs bearing regulatory, warning or emergency messages, and to ensure effective recognition of safety colours. Certain illuminants, such as low and high pressure sodium lamps and clear mercury vapor lamps, may distort colours under some circumstances. To avoid misinterpretation, supplementary illumination (e.g. by incandescent lamps) may have to be provided.

Internal illumination improves legibility. Lighted signs, when used with a dark background, are a reinforcing device to help separate a sign system from competing signs. For example, airport information signs use internal illumination to stand out against a background of airline and concessionaires' advertising signs which compete for the viewer's attention.

Sight Lines and Sign Placement

The placement of signs within a facility or on a site involves these considerations: where to locate signs; how to install them; and (especially in the case of directional signs) how many? A basic human factor concerned with the placement of signs is the average eye-level height. It may seem obvious that pedestrian signs should be placed at eye level, but that would be a gross simplification of the problem. The important thing to remember is that signs should be placed to avoid obstructing normal *sight lines*. They should not be obstructed by architectural features or other people. Some questions to consider are:

- Can the sign be seen over the heads of other people by an average viewer?
- Will the sign face be at an acute angle to the normal line of vision?
- Will the sign be outside the normal field of vision?
- What is the background behind the sign and the environment around it?
- Will other signs or architectural features be in the way of the sight lines?
- Will the sign obstruct the views of other signs?

Installation of signs: where and how? Signs may be surface-mounted, free-standing or ceiling suspended. The nature of the facility or site, the type of sign and the needs of the users generally determine the most appropriate method of installation.

To maintain the integrity of the environment and to achieve coherence of the system, signs should be displayed in a manner that is consistent throughout a facility. For example, all directional signs should appear at the same height and become reference points that are readily noticeable.

Placing a sign should be considered as the process of integrating it into its environment. Whether it is to be placed in a natural or an architectural environment, the sign should relate to (but be distinct from) the visual characteristics of the site. A sign should not obstruct important features, nor should it be visually obstructed. The planner of a sign installation must take into account the landscape (terrain, vegetation), or the architectural details (surfaces, textures, colours, modularity).

Directional signs: how many? There are many factors that influence decisions on how many signs will be needed to provide direction on a particular route. These factors include the nature of the environment (complexity), the distance between starting point and destination, and the number of decision points (e.g. intersections) on a route. Research has shown that signs should be located just before each decision point. Where there are long distances between decision points, a message may need to be repeated confirming the direction towards the destination.

Providing information and direction to help users should not lead to a proliferation of signs. Oversigning causes too many reference points, diminishes essential information, confuses people, and clutters the environment.

Sign Dimensions. The effect that the size of a specific sign will have on the site should be assessed at the planning stage. This assessment applies to exterior signs in particular, where the environmental or esthetic concerns should be part of the criteria that determine the ultimate size and location of a sign.

The size of a sign should be based on two principles: the need to identify, and the need to integrate. A sign should therefore communicated effectively and be of a size appropriate for the architecture or site that it is to identify. The ultimate size and location of the sign should not lead to visual detraction.

Creating a *readable* environment. The signage for a facility must be planned as an integrated system which explains the environment, enables visitors to understand readily its spatial relationships, and helps them find their intended destination. In addition to directional signs, there may be a need for regulatory, safety and emergency messages. All these various signs interact and their appearance, their messages, and their placement affect the communications value of the signage system.

6. CONCLUSIONS AND RECOMMENDATIONS

Recent studies sponsored by the Transportation Development Centre of Transport Canada have identified the lack of appropriate signage as a major issue in meeting the needs of travellers with visual, hearing or cognitive impairments. Environmental communication systems are designed for the able-bodied adult with above-average vision and hearing. Better systems that would complement and improve on the existing information systems are required.

Changes are required but the procedures involved in change are not well coordinated or understood. Concerned individuals wishing to change signage systems for travellers with disabilities face a bewildering array of organizational and procedural hassles. The purpose of this report was to identify and describe the procedures and other considerations involved in the implementation of new information signage and/or communication systems in transportation terminals, such as airport buildings, ferry terminals, bus and railway stations, for persons with visual, hearing or cognitive disabilities.

In the implementation of any new information signage or communication system, however, there are a number of considerations -- not the least of which are understanding the roles and responsibilities of the organizations involved, and ensuring that the proper procedures have been followed to provide conformance with the published standards and requirements. In this review of the process, procedures and requirements for new information signage and/or communication systems, the focus was on the needs of persons with visual, hearing or cognitive disabilities. What do they need? Who are the major actors? If a change is required, how is it done? What are the hurdles? If change is accomplished, how is success measured? Who regulates and enforces conformance with established or proposed standards?

WHAT IS NEEDED?

> *Individuals with disabilities shall be assured access to fundamental elements of daily life that are generally available in the community. Wherever possible the effects of an impairment or disability on an individual's life shall not be determined by environmental factors.*
>
> (Principle 5 from the Prime Minister's Declaration on the Decade of Disabled Persons)

The issue of accessibility by disabled persons to various modes of transportation has received increasing attention in recent years. Considerable energy, funding and research have been directed toward environmental access needs. Much of this attention has been directed toward removing architectural barriers facing the individual who is confined to a wheelchair, or who is otherwise mobility impaired. However, similar efforts for Canadians with perceptual or cognitive impairments have been lacking. There is a need to identify the environmental access needs of perceptually and cognitively impaired travellers so that they may use transportation terminals with an efficiency, convenience, and dignity comparable to that experienced by the general public. Specifically, efforts must be made to assist perceptually and cognitively impaired persons to travel independently, taking into consideration the effects of the environment on safe and efficient movement. Building designers are only beginning to recognize and acknowledge the needs of persons with perceptual or cognitive impairments.

The limited focus on access issues for perceptually and cognitively impaired persons may be due, in part, to the fact that they are not normally denied access to transportation facilities because of architectural barriers. Rather they have accessibility difficulties due to the problems of orientation to unfamiliar, and often large and confusing, transportation terminals. Persons with perceptual and cognitive impairments need to know where they are and how to reach a desired destination quickly and safely, or how to obtain needed information.

The information necessary to resolve orientation problems is often lacking or inaccessible. Solutions to orientation problems are possible through: appropriate visual, auditory, tactile, and kinesthetic cues; speech, large print or braille technologies; visual backup of auditory messages, assistive listening and telecommunications devices; simplification and standardization; and trained human resources. Clear, simple designs and direct, easy-to-access information systems are required to create an environment that meets the orientation and mobility needs of persons with perceptual or cognitive impairments.

The goal is unequivocal: Independence. The final assessment of need for improved environmental communication systems should be based on the simple question: Will the proposed modifications allow the person with disabilities to travel more independently, more safely, and more purposefully?

If the answer is yes, the environment thus created has the added benefit of also being a better environment for the general public.

HOW IS IT DONE?

The Canadian National Institute for the Blind has established the path by preparing and publishing a set of design guidelines for meeting the access needs of blind and visually impaired travellers in transportation terminals. These have been forwarded to the Canadian Standards Association for consideration.

Other studies have focused on proposed improvements for the deaf and hard of hearing traveller and for travellers with cognitive or emotional disorders. Out of these studies come a number of recommendations. Of particular interest is the need for simplification and standardization of environmental communication systems. Standardization reduces an important source of anxiety for all travellers -- the unknown and unpredictable. Simplification reduces the demands placed on the physical and psychological capabilities of the traveller.

Unfortunately, development of recommendations and guidelines by appropriate user groups is not enough. As one report put it: *"The major problems rest not so much in the lack of suitable technology as in its conspicuous absence in airports, bus and train stations, and ferry terminals"* (10). The problem, therefore, is largely in the area of implementation

Individual efforts to improve the quality and effectiveness of specific environmental communication devices have typically not been implemented universally. Despite the widespread need for improved signage and symbol systems to communicate essential safety, warning and directional information, various problems have prevented their development and use. These problems arise from the failure to include careful design and experimental evaluation when assessing systems.

A model for evaluating and predicting signage performance must be developed. An example is Braaksma's sight line analysis (2). While evaluative research cannot answer all the questions surrounding the development of effective signage, it can provide insight to the relative performance of a particular system and the overall performance of a signage system for a given user group. This information can be used to improve the effectiveness of a particular device and to predict the effectiveness of a signage system for a target population.

The need to conduct evaluative research at both the design and implementation stages is especially critical for supporting the development of standards for signage. Because of the proliferation of symbols and symbol systems, there is an urgent need to develop and standardize information systems which are good graphically and which communicate effectively with the intended audience.

Guidelines for improved environmental communication systems proposed by associations for persons with disabilities must (1) have a standard method of evaluation that will be acceptable by the associations and the responsible authorities, and (2) be able to be tested by this accepted method so that it may be accepted as a standard by all concerned.

WHO IS RESPONSIBLE?

Different organizations have different requirements, some of which seem to be contradictory to each other and to the special needs of persons with disabilities. Various published standards may or may not be used by transportation terminal managers. And the requirements and specifications for these standards are not always followed by the authorities responsible for implementing the signage.

Although a number of organizations are developing or using several different standards, all the standards seem to fall back to the Canadian Standards Association (CSA) standards. The Federal Identity Program (FIP) signage system is derived to a large extent from the CSA Standard CAN3-Z321, Signs and Symbols for the Occupational Environment. The Airport Authorities Operating Manual AK-62-07, Building Signs Manual, is derived to a large extent from the FIP Manual. The CSA standards in turn are derived from the published standards of the International Association for Standardization (ISO).

The new Barrier-Free Design Standard (BFDS), CAN/CSA-B651-M90, developed and published jointly by Public Works Canada and the Canadian Standards Association, appears to be finding acceptance for application in transportation terminals. But it is still too early to measure this acceptance. The National Transportation Agency is supposedly developing their own standards for application in transportation terminals. These will conform with the CSA and FIP standards. And the Agency has the authority, through Bills C-18 and C-131, to regulate accessibility for persons with disabilities on all transportation modes under federal jurisdiction.

It is therefore concluded that the Canadian Standards Association (CSA) has the main responsibility for developing, evaluating and approving standards. If an appropriate evaluation methodology can be designed and approved by the CSA Technical Committee on Barrier-Free Design under the jurisdiction of the Standards Steering Committee on Public Safety, then it could be used for defining appropriate standards. These standards would then require approval as a National Standard by the Standards Council of Canada.

From these proposed National Standards, the FIP standards for the Government of Canada could be modified and applied through the Transport Canada AK standards in their operating manual and regulated and enforced by the National Transportation Agency to ensure implementation and conformance with the NTA standards (assuming that the FIP, AK and NTA standards are derived from the CSA standards as appears to the case currently).

It is therefore recommended that any agency or organization wishing to implement new information signage for travellers with disabilities in transportation terminals should approach the CSA Technical Committee on Barrier-Free Design under the jurisdiction of the Standards Steering Committee on Public Safety of the Standards Council of Canada with the express purpose of having the new signage system or device approved as a National Standard.

TAKING THE FIRST STEP

The first step is to develop a procedure for evaluation that will be acceptable by the responsible authorities. ISO Standard 9816 specifies procedures for the development and testing of public information symbols but the procedures may need some modification to be applicable to the special environmental communication system needs of travellers with disabilities.

It is recommended that the Transportation Development Centre take this first step by undertaking a study to develop an appropriate research methodology for evaluating environmental communication systems that will be acceptable to the Canadian Standards Association as a means of proving a system's appropriateness as a National Standard of Canada.

A brief summary of a possible evaluation methodology is outlined below:

- a need is identified for a specific environmental communication system or device;
- a study group of the CSA Technical Committee on Barrier-Free Design is established, under the leadership of a chairperson, consisting of 6 to 10 volunteers;
- the best method of conducting the project is determined (in terms of methodology and evaluation criteria) and relevant special interest groups are identified for input;
- a review is conducted of current practices in Canada and internationally;
- candidate communication systems are identified for consideration and evaluation and versions of the candidate systems are defined to meet the requirements of the CSA standards;
- these communication systems or devices are evaluated with as large a number of the target population as possible in actual field conditions to measure their conformance to the established criteria.

REFERENCES

1. B.C. Ministry of Municipal Affairs. *The Section 3.7 Handbook: Building Requirements for Persons with Disabilities Including Illustrations and Commentary.* Part 3.7.3.18(1) to 3.7.2.21(1). B.C. Ministry of Municipal Affairs. 1984.

2. Braaksma, John P. and W. J. Cook. "Human Orientation in Transportation Terminals". *Transportation Engineering Journal*, March 1980. pp 189-203.

3. Canadian National Institute for the Blind. *Access Needs of Blind and Visually Impaired Travellers in Transportation Terminals.* Prepared by the Canadian National Institute for the Blind for the Transportation Development Centre, Transport Canada, Montreal, Quebec. December 1987.

4. Canadian National Institute for the Blind. *Design Guidelines for Meeting the Access Needs of Blind and Visually Impaired Travellers in Transportation Terminals.* TP 10067E. Prepared by the Canadian National Institute for the Blind for the Transportation Development Centre, Transport Canada, Montreal, Quebec. December 1989.

5. Canadian Standards Association (CSA). *Barrier Free Design: A National Standard for Canada.* CAN/CSA-B651-M90. Canadian Standards Association (CSA), Toronto, Ontario. 1990.

6. Canadian Standards Association (CSA). *Signs and Symbols for the Occupational Environment.* CAN3-Z321-77. Canadian Standards Association (CSA), Toronto, Ontario. September 1977.

7. Easterby, R.S. and H.J.G. Zwaga, editors. *Information Design.* John Wiley and Son Ltd., Toronto, Ontario. 1984.

8. Fitzpatrick, M.E., Ben Barkow and Joan Beattie. *Intercity Travel and the Deaf and Hard of Hearing Traveller: An Analysis of the Current State of Accessibility.* TP 9839 E. Prepared by the Behavioural Team, A Corporation and the Canadian Hearing Society for the Transportation Development Centre, Montreal, Quebec. September 1989, reprinted with revisions March 1990. 125p.

9. Follis, J. and D. Hammer. *Architectural Signing and Graphics.* Whitney Library of Design, New York, New York. 1979.

10. Geehan, Tom and Ulrika Wallersteiner. *Assessment of Traveller Information Systems.* TP 10023 E. Prepared by TransVision Consultants Ltd. and Ergo Systems Canada Inc. for the Transportation Development Centre, Montreal, Quebec. October 1989. 154p.

11. International Civil Aviation Organization. *International Signs to Provide Guidance to Persons at Airports.* Doc 9430-C/1080. International Civil Aviation Organization, Montreal, Quebec. 1984.

12. International Organization for Standardization. *Specification for Public Information Symbols.* ISO 7001:1990. Published by the British Standards Institution, London, United Kingdom. July 1990.

13. Marine Atlantic. *Marine Atlantic Graphic Standards Manual.* Marine Atlantic, Moncton, New Brunswick. undated.

14. McLendon, C.B. and M. Blackstone. *Signage: Graphic Communications in the Built World.* McGraw-Hill Inc., New York, New York. 1982

15. Public Works Canada. *Barrier-Free Design: Access to and use of buildings by physically disabled people.* Public Works Canada, Ottawa, Ontario. 1985.

16. Public Works Canada. *Orientation and Wayfinding in Public Buildings: An Overview.* AES/SAG 1-4: 88-17. Public Works Canada, Ottawa, Ontario. October 1988.

17. Public Works Canada. *Orientation and Wayfinding in Public Buildings: A Design Guideline.* AES/SAG 1-4: 87-2. Public Works Canada, Ottawa, Ontario. July 1987.

18. Public Works Canada. *Signage: Guidelines and Procedures.* Public Works Canada, Ottawa, Ontario. date unknown.

19. Public Works Canada. *1-2-3 Evaluation and Design Guide to Wayfinding.* AES/SAG 1-4: 86-15. Architectural and Engineering Services, Public Works Canada, Ottawa, Ontario. January 1990.

20. Transport Canada. *Transport Canada Building Signs Manual.* TP130. Airport Authority Group, Transport Canada, Ottawa, Ontario. November 1986.

21. Treasury Board of Canada. *Federal Identity Program (FIP) Manual.* Various volumes. Treasury Board of Canada Secretariat, Ottawa, Ontario. September 1987 to March 1990.

ABBREVIATIONS

AFNOR	Association française de normalisation
ANSI	American National Standards Association
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BNQ	Bureau de normalisation du Québec
BSI	British Standards Institution
CNIB	Canadian National Institute for the Blind
CGSB	Canadian General Standards Board
CSA	Canadian Standards Association
DIN	Deutsches Institute für Normung
EEMAC	Electrical and Electronic Manufacturers Association of Canada
FIP	Federal Identity Program
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Standards Organization
JIS	Japanese Industrial Standards
NFPA	National Fire Protection Association
NRC	National Research Council
NTA	National Transportation Agency
PWC	Public Works Canada
SAA	Standards Association of Australia
SAE	Society of Automotive Engineers
TC	Transport Canada
TDC	Transportation Development Centre
UL	Underwriter's Laboratories (U.S.)
ULC	Underwriters' Laboratories of Canada

APPENDICES

ANNOTATED REFERENCES

Federal Identity Program (FIP)
Treasury Board

This is the corporate identity program of the Government of Canada. The program's policy is issued by the Treasury Board (Chapter 470 of the Administrative Policy Manual). The applications of the Federal Identity Program (FIP) signage system are set out in the FIP Manual.

The Treasury Board has published a Design Guide which is quite specific about the way signs should look. It says less however about where signs should go or about matters related to orientation and wayfinding. On the 'look' of a sign, you can recognize FIP signs because they have the following characteristics:

Generally all signs use helvetica medium letters, upper and lower case in white; dark grey (charcoal) backgrounds; and colour-coded shapes for symbol signs.

Exterior signs all have dark grey modular faces and supports. Various formats are used for combinations of message elements. They generally have the Federal symbol at the top left corner and multi-occupancy signs have the "Government of Canada" signature with building name or, the major federal tenants in the building are named. Other sign types feature organizational and branch titles with or without facility names. The lower band of each charcoal sign is a light grey module displaying the Canada wordmark.

Interior Signs use the same basic colours for operational signs as the exterior signs. 'Common-use' signs have white or black coloured letters and coloured backgrounds: red on white for messages prohibiting an action, white on black for those requiring obligatory action, black on yellow for those indicating caution, white on red for those indicating danger, and white on green for emergency-related messages. Symbol signs, when used, are a combination of colours and shapes (circles, triangles and squares, depending upon what the sign is saying).

Reference: Treasury Board of Canada. *Federal Identity Program (FIP) Manual*. Various volumes. Treasury Board of Canada Secretariat, Ottawa, Ontario. September 1987 to March 1990.

Barrier-Free Design Standard (BFDS)
Public Works Canada

This document (CAN/CSA-B651-M90) developed by Public Works Canada is an important reference work covering the whole subject of access to and use of buildings by physically-disabled people.

It is primarily a technical standard for application to new and existing buildings. Departments having control and authority for real property should be consulted for application to specific buildings.

The standard describes a level of access for a broad range of users including: people who use wheelchairs for mobility, persons with reduced hearing or seeing ability, persons with reduced stamina, strength, dexterity and speed such as elderly people, ambulance attendants suing stretchers, and able-bodied people. Access is provided so that public services and employee areas are accessible and safely usable to ensure equal access to employment opportunities. Design requirements and operational procedures related to life safety and building exits are also included.

This document is organized into three sections. The first part deals briefly with guidelines for the application of the standard. These are followed by technical design requirements outlining how areas and components are to be designed if they are provided in a facility. Appendices are included to provide additional information. Keywords: Barrier-Free Design, Buildings, Disabled, Handicapped, Offices, Accessibility.

Reference: Canadian Standards Association. ***Barrier-Free Design: A National Standard for Canada***. CAN/CSA-B651-M90. Canadian Standards Association, Toronto, Ontario. 1990.

Signs and Symbols for the Occupational Environment
Canadian Standards Association

CSA Standard CAN3-Z321, Signs and Symbols for the Occupational Environment, was prepared in response to a request made by the Canada Safety Council and supported by the Canadian Society of Safety Engineering. The Canada Safety Council, after a comprehensive study of the signage systems used in Canada, concluded that the proliferation of signs was such that standardization was required.

The Standard covers a classification of signs, general requirements, and graphic requirements of symbols, legends and the use of arrows.

During the development of this Standard, the Technical Committee took cognizance of existing Standards and practice in Canada and other countries. Principles established by TC 80 and TC 145 of the International Organization for Standardization (ISO) were adopted where possible.

This Standard was prepared by the CSA Technical Committee on Signs and Symbols for the Occupational Environment, under the jurisdiction of the CSA Standards Steering Committee on Occupational Protective Equipment and Products, and was formally approved by these Committees. It has been approved as a National Standard of Canada by the Standards Council of Canada.

Reference: Canadian Standards Association. *Signs and Symbols for the Occupational Environment*. CAN3-Z321-77. Canadian Standards Association (CSA), Toronto, Ontario. September 1977.

1-2-3 Evaluation and Design Guide to Wayfinding
Public Works Canada

This document, published by Public Works Canada, is a guideline to complement FIP specifications with respect to wayfinding problems in built settings. The *Guide* is divided into three sections:

Part 1 introduces some of the more important principles of building evaluation, and defines what useful visitor information actually is. The information in Part 1 is general, and prepares the reader for the specifics which are contained in Part 2.

Part 2 guides the reader through data gathering activities, noting that signs are just one aspect of the way that the building environment communicates with its visitors.

Part 3 comprises two approaches to solving problems once they have been identified. There is a temporary, inexpensive solution and a longer-term, permanent and more costly solution. In environmental communication, however, permanency is a relative term because of the dynamics of the environment.

The Appendices contain definitions of terms used in the *Guide* and design intent drawings, diagrams that illustrate text, and other useful information.

Reference: Public Works Canada. *1-2-3 Evaluation and Design Guide to Wayfinding*. AES/SAG 1-4: 86-15. Architectural and Engineering Services, Public Works Canada, Ottawa, Ontario. January 1990.

Airport Building Signs Manual
Transport Canada

This manual, prepared by the Transport Canada Airports Authority Group, is designed to provide assistance to managers, planners, designers and consultants for the planning of new sign systems or the updating of existing systems. It prescribes standards, guidelines and accepted practices for the provision of an efficient airport sign system.

The manual states that standardization will reduce the cost in contrast to specially designed systems. Standardization will also ensure the familiarization that the use of the pictographs requires.

The manual relates to those airport signs inside the buildings or attached to the building, and site identification signs. For road and traffic signs, the reader is referred to *Manual of Uniform Traffic Control Devices*. For runway and taxiway signs, reference is made to *Airport Operational Guidance Signs*.

This document, prepared in November 1986, covers all aspects of: implementing sign systems, sign standards and construction, interior building signs, exterior signs, and signs for airlines and concessions, security check-in and advertising. Examples and specifications are provided for all pictographs.

The present technical standards presented in this manual are to be replaced by the barrier-free design standards CAN/CSA-B651-M90.

Reference: Transport Canada. *Airport Building Signs Manual*. TP130. Airport Authority Group, Transport Canada, Ottawa, Ontario. November 1986.

Graphics Standards Manual
Marine Atlantic

This manual developed by Marine Atlantic is a revised and condensed version of the former *Graphic Standards Manual*. It provides the basic rules on all aspects of the visual identity program of the company. It is noted that only through scrupulous and consistent application of those rules that the organization can establish a strong visual image. The manual is divided into four sections:

Basic Elements deals with the basic elements of the visual identify program. They are: the symbol, the signature, typography and corporate colours.

Stationery and Forms are the elementary vehicle of Marine Atlantic's corporate identity. This section provides the general norms established to project a uniform and consistent visual image through all corporate printed material.

Vessels and Vehicles have distinctive corporate graphics applied to make them easily identifiable. This section deals with the application of the logo and corporate colours to the vessels.

Signage and Buildings is recognized as a significant component of Marine Atlantic's corporate identity program and it is noted that signs are the primary means used to inform and direct the people using the transportation services.

Reference: Marine Atlantic. *Marine Atlantic Graphic Standards Manual*. Marine Atlantic, Moncton, New Brunswick, 1991.

International Signs to Provide Guidance
International Civil Aviation Organization

In 1970 the Council of ICAO published a set of standard signs to facilitate the efficient use of airport terminals by travellers and other users. The Council's decision to promote the uniform adoption of certain graphic symbols for easy location of the more commonly used facilities and services in terminal buildings was taken to provide guidance to the many airport authorities faced with increasing congestion in terminal buildings and having to modify or extend their facilities.

After more than ten years of use and experience the signs were reviewed by ICAO and, as a result, certain modifications, deletions and additions were made. The new or revised signs provided in this 1984 guide, *International Signs to Provide Guidance to Persons at Airports*, are intended for introduction at airport passenger terminals.

The report outlines the general principles concerning the use of signs and examples of international signs designed to provide guidance to persons at airports.

Reference: International Civil Aviation Organization. *International Signs to Provide Guidance to Persons at Airports (Doc 9430-C/1080)*. Published by the International Civil Aviation Organization, Montreal, Quebec. 1984.

Specification for Public Information Symbols
International Standards Organization

This International Standard (ISO 7001: 1990) specifies the image content of graphical symbols used for the information of the public. The fields of application specified for each graphical symbol are indicative of the way it is intended that the symbols should be used; their application may be extended into other fields where this is considered appropriate.

The reason for the publication of this International standard is the increasing use of non-verbal presentation of information in places, buildings and printed materials used by the public. Graphical symbols should be used where verbal messages might be a barrier to understanding.

ISO 9816 specifies procedures for the development and testing of public information symbols. Owing to cultural and technological differences between countries, it has been decided to standardize only the image content of the graphical symbols, not the graphical images themselves. For each of the image contents included in this International Standard, the details are specified on a single sheet. Each single sheet also contains a guide-line example which conforms to the standard image content. The guide-line examples are not binding, but their use is encourage.

ISO/TR 7239 specifies a number of definitions and principles concerning the development and application of public information symbols, and should be used as a guide to the application of this International Standard.

Reference: International Organization for Standardization. *Specification for Public Information Symbols (ISO 7001:1990)*. Published by the British Standards Institution as BS 6034:1990 (which is identical to ISO 7001:1990), London, U.K., July 1990.

Design Guidelines for Visually Impaired Travellers
Canadian National Institute for the Blind

This report presents design recommendations and guidelines for meeting the access needs of blind and visually impaired travellers in transportation terminals. It describes how blind and visually impaired persons orient themselves and move through an environment. The report reveals various problems faced by the visually impaired in travelling unassisted from place to place.

Orientation and mobility are defined vis-a-vis how blind and visually impaired persons travel. The use of mobility aids (guide dog, white can, electronic devices, etc.) and of sensory information (visual, tactual and auditory) to effect safe and graceful travel through an environment is described and discussed.

Specific design recommendations for many architectural elements of transportation terminals are presented, including recommendations with respect to signage and symbols.

Reference: Canadian National Institute for the Blind. *Design Guidelines for Meeting the Access Needs of Blind and Visually Impaired Travellers in Transportation Terminals*. TP 10067E. Prepared by the Canadian National Institute for the Blind for the Transportation Development Centre, Transport Canada, Montreal, Quebec. December 1989.

LIST OF CONTACTS

STANDARDS ORGANIZATIONS

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GOVERNMENT ORGANIZATIONS

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c/o Administrative Policy Branch
Treasury Board of Canada
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Architectural and Engineering Services
Public Works Canada
Sir Charles Tupper Building
Riverside Drive
Ottawa, Ontario K1A 0M2

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National Transportation Agency of Canada
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Edmonton International Airport
Edmonton, Alberta

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Halifax International Airport
Halifax, Nova Scotia

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Montreal International Airport
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Dorval, Quebec H4Y 1B9

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Contact: Nicole Jacobs, Chairperson, Signage Committee
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Toronto International Airport
Toronto, Ontario

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Contact: Ms. Hendricks, Terminal Two
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Contact: Dan Simich, Manager, Terminal Three, Lockheed Air Terminals
Phone: (416) 672-1029

Vancouver International Airport
Vancouver, B.C. V7B 1T6

Contact: Danielle Moore, Supervisor, Terminal Services
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Winnipeg International Airport
Winnipeg, Manitoba

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BUS TERMINAL OPERATIONS

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Greyhound of Canada Ltd.
Calgary, Alberta

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Montreal Bus Terminal
Voyageur Bus Company
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Regina Bus Terminal
Saskatchewan Transportation Company
Regina, Saskatchewan

Contact: Greg Beattie, Sales and Service Division
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Saskatoon Bus Terminal
Saskatchewan Transportation Company
Saskatoon, Saskatchewan

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Toronto Bus Terminal
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Port aux Basques, Nfld.
Contact: Lorne Wicks, Terminal Manager
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Western Institute for the Deaf and Hard of Hearing
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GLOSSARY OF TERMINOLOGY

Auditory Map -- Oral description of a building layout or complex space provided in the interests of orientation. Also referred to as a *verbal* or *spoken* map.

Application -- The act of applying the design standards or general rules of the FIP to an object (e.g. a sign or a vehicle).

Applied Title -- The approved name used in the signature to identify an organization, program or activity.

Blade -- Modular component of a signface.

Border -- The white area at the perimeter of a symbol.

Braille -- A method writing words by means of dots, for the use of blind persons. Dots are arranged in cells and are raised. They are read by touch.

Building Directory -- Information, usually typographic in nature, providing the names of the tenants in a building.

Colours -- The distinctive hues associated with each type of symbol.

Common-Use Sign -- Any sign with a message related to the facility itself. This type of sign remains valid regardless of changes in the facility's occupants (e.g. a directory board or a sign relating to fire safety, or signs identifying rooms).

Design Standard -- The approved rules on the use of design elements (as outlined in the FIP policy for most government departments). They prescribe elements such as shape, size, layout, colour, typography, and use of symbols.

Disability -- In the context of health experience, a disability is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being.

Environmental Communication(s) -- Transfer of orientation, wayfinding, and other information within the built environment, by means of signs and other communications devices or architectural features to enable people to reach destinations.

Federal Identity Program (FIP) -- The means whereby the Government of Canada identifies its facilities and its presence visually.

Field of Application -- The gamut of items that bear the identifying elements of FIP, e.g. stationery, vehicles, signs.

FIP Signage -- Primary identification signs; common-use signs; operational signs; and project signs. (Excluded are signs that are subject to a regulation which specifies their design.)

Floor Directory -- Information, usually typographic in nature, providing the names of departments or services on that floor and directions thereto.

Flush (left or right) -- The lateral position of a word or message, left or right, within the viewing area; as distinct from centred.

Glare -- Undesirable degree of sheen reflected off the surface of a sign causing deterioration of legibility.

Glyph -- An abstract conceptual or object-related (i.e. pictorial) representation.

Guidelines -- Statements indicating instruction which, while not mandatory, should be followed unless there is good reason not to do so. While valid reasons for non-compliance must be documented, prior Treasury Board approval is not required.

Handicap -- In the context of health experience, a handicap is a disadvantage for a given individual, resulting from an impairment or disability that limits or prevents the fulfillment of a role that is normal (depending on age, sex, and social and cultural factors) for that individual.

Helvetica Medium -- Currently the most popular letterform with application to signage and the one selected by FIP for use in federal government buildings.

Interactive – Capable of being interrogated; a device used in environmental communications that can, on demand, produce information specific to a user's needs, generally through presentation on a video screen and/or through a telecommunications connection.

Legend – A written verbal message that is used in combination with a symbol to reinforce its meaning, or to communicate a message that cannot be expressed by a symbol; specifically relates also to die-cut vinyl letters or images.

Legibility – Qualities of a sign that determine how easily the viewer can 'read' or discern the message.

Lower Case – Letters that are not CAPITALS.

Mobility – Ability to move about or travel safely, comfortably, and independently.

Non-Verbal Communication – One which relies upon symbols or pictographs for its meaning.

Official Languages Act – Makes provision for the use of English and French (the 'official' languages of Canada) and determines the form to be used in their display.

Operational Sign – Any sign with a message related solely to the operational needs of, and hence the responsibility of, the occupant organization. This type of sign is normally located with the space the organization occupies.

Pictographs – Glyph or symbol incorporated into a sign; hence pictographic to denote a non-verbal sign.

Primary Identification Sign – The first sign bearing the federal signature and the wordmark and identifying a federal facility.

Project Sign – A sign that provides information about federal programs or projects, e.g. public works, employment programs, or housing.

Readability – Qualities of a sign that allow the viewer to comprehend or understand the message displayed; compare to legibility.

Referent – The functional concept that the symbol stands for.

Sanserif – Letterforms without serifs (or *feet*).

Serif – *Feet* of a letter: short cross-lines at terminals of letters classified in this way (as distinct from *sanserif*).

Shape – The outer geometrical configuration of a symbol.

Sign – An entire visual communication device. *Information sign* means a sign denoting the location of (or direction to) an object or facility, or a sign denoting a permissive action. *Regulatory sign* means a sign denoting an order. *Warning sign* means a sign denoting the presence of a hazard.

Signature – The combination of a symbol and a title.

Signface – Reading area of a sign on which are displayed its legends and symbols.

Special Symbol – A graphic device, other than the Coat of Arms, the flag symbol, the "Canada" wordmark and the federal emblem, intended to identify systematically a project, program, service, activity, or product of the government. Some examples of special symbols are logotypes, marks or badges.

Symbol of Access – Represents to a person in a wheelchair, specifically that the access (entrance) next to which it is displayed is accessible, and generally that the building's facilities are similarly accessible.

Symbol – Glyphs or pictographs are pictorial representations used in signs to constitute a non-verbal means of conveying information. Such signs are called symbol signs and they consist of a border, colours, a glyph, and a shape.

Tactile or Tactual – What can be physically felt, generally with fingers.

Tactile Signs – Signs with raised letters that are interpreted or read by tracing with fingers over the surfaces. Letters are raised 1 mm.

Telecommunications Device for the Hearing- and Speech-Impaired (TDD) – Device which enables visual typographical messages to be transmitted and received over telephone lines between one user and another.

"T" Switch – Switch in a hearing aid that enhances a hearing-impaired person's ability to use a telephone.

Understandability – The extent to which the contents of a sign message are understood by the viewer.

Verbal Message – One which relies upon words (spoken or typographic) for its meaning.

Visibility – The quality of a sign that makes it separately visible from its background (conspicuity, detectability).

Wayfinding – Ability of a traveller to arrive with ease at his or her destination.